EXHIBIT B

License Amendment Request dated June 24, 1983

Exhibit B consists of revised pages of Appendix A Technical Specifications as listed below:

Pages

TS-iv
TS.3.10-1
TS.3.10-2
TS.3.10-9
TS.3.10-11
Figure TS.3.10-5
Figure TS.3.10-7

APPENDIX A TECHNICAL SPECIFICATIONS

LIST OF FIGURES

3.10 CONTROL ROD AND POWER DISTRIBUTION LIMITS

Applicability

Applies to the limits on core fission power distribution and to the limits on control rod operations.

Objective

To assure 1) core subcriticality after reactor trip, 2) acceptable core power distributions during power operation, and 3) limited potential reactivity insertions caused by hypothetical control rod ejection.

Specification

A. Shutdown Reactivity

The shutdown margin with allowance for a stuck control rod assembly shall exceed the applicable value shown in Figure TS.3.10-1 under all steady-state operating conditions, except for physics tests, from zero to full power, including effects of axial power distribution. The shutdown margin as used here is defined as the amount by which the reactor core would be subcritical at hot shutdown conditions if all control rod assemblies were tripped, assuming that the highest worth control rod assembly remained fully withdrawn, and assuming no changes in xenon or boron concentration.

B. Power Distribution Limits

1. At all times, except during low power physics testing, measured hot channel factors, F_Q^N and $F_{\Delta H}^N$, as defined below and in the bases, shall meet the following limits:

$$F_Q^N \times 1.03 \times 1.05 \leq (2.32/P)^* \times K(Z) \times BU(E_j)$$

$$F_{\Delta H}^N \times 1.04 \leq 1.55 \times [1+ 0.2(1-P)]$$

where the following definitions apply:

(a) K(Z) is the axial dependence function shown in Figure TS.3.10-5.

(b) Z is the core height location

(c) E_j is the maximum pellet exposure in fuel rod j for which the F_Q^N is being measured.

(d) $BU(E_j)$ is the normalized exposure dependence function for Exxon Nuclear Company fuel shown in Figure TS.3.10-7. For Westinghouse fuel, $BU(E_j) = 1.0$

(e) P is the fraction of full power at which the core is operating. In the F_Q^N limit determination when $P \leq 0.50$, set $P = 0.50$.

* (2.21/P) shall be used for Westinghouse assemblies

(f) F_Q^N or $F_{\Delta H}^N$ is defined as the measured F_Q^N or $F_{\Delta H}^N$, respectively, with the smallest margin or greatest excess of limit

(g) 1.03 is the engineering hot channel factor, F_Q^E, applied to the measured F_Q^N to account for manufacturing tolerance.

(h) 1.05 is applied to the measured F_Q^N to account for measurement uncertainty

(i) 1.04 is applied to the measured $F_{\Delta H}^N$ to account for measurement uncertainty

2. Hot channel factors, F_Q^N and $F_{\Delta H}^N$, shall be measured and the target flux difference determined, at equilibrium conditions according to the following conditions, whichever occurs first:

(a) At least once per 31 effective full-power days in conjunction with the target flux difference determination, or

(b) Upon reaching equilibrium conditions after exceeding the reactor power at which target flux difference was last determined, by 10% or more of rated power.

F_Q^N(equil) shall meet the following limit for the middle axial 80% of the core:

$$F_Q^N \text{ (equil)} \times V(Z) \times 1.03 \times 1.05 \leq (2.32/P) \times K(Z) \times BU(E_j)$$

where V(Z) is defined in Figure 3.10-8 and other terms are defined in 3.10.B.1 above.

3. (a) If either measured hot channel factor exceeds its limit specified in 3.10.B.1, reduce reactor power and the high neutron flux trip setpoint by 1% for each percent that the measured F_Q^N or $F_{\Delta H}^N$ exceeds the 3.10.B.1 limit. Then follow 3.10.B.3.(c).

(b) If the measured F_Q^N (equil)exceeds the 3.10.B.2 limits but not the 3.10.B.1 limit, take one of the following actions:

1. Within 48 hours place the reactor in an equilibrium configuration for which Specification 3.10.B.2 is satisfied, or

2. Reduce reactor power and the high neutron flux trip setpoint by 1% for each percent that the measured F_Q^N(equil) x 1.03 x 1.05 x V(Z) exceeds the (2.32/P) x K(Z) x $BU(E_j)$ limit.

mechanical properties to within assumed design criteria. In addition, limiting the peak linear power density during Condition I events provides assurance that the initial conditions assumed for the LOCA analyses are met and the ECCS acceptance criteria limit of 2200°F is not exceeded.

During operation, the plant staff compares the measured hot channel factors, F_Q^N and $F_{\Delta H}^N$, (described later) to the limit determined in the transient and LOCA analyses. The limiting $F_Q(Z)$ includes measurement, engineering, and calculational uncertainties. The terms on the right side of the equations in section 3.10.B.1 represent the analytical limits. Those terms on the left side represent the measured hot channel factors corrected for engineering, calculational, and measurement uncertainties.

$F_Q(Z)$, Height Dependent Heat Flux Hot Channel Factor, is defined as the maximum local heat flux on the surface of a fuel rod at core elevation Z divided by the average fuel rod heat flux, allowing for manufacturing tolerances on fuel pellets and rods. The maximum value of $F_Q(Z)$ is 2.32/P for the Prairie Island reactors. This value is restricted further by the K(Z) and $BU(E_j)$ functions described below. The product of these three factors is $F_Q(Z)$.

The K(Z) function shown in Figure TS.3.10-5 is a normalized function that limits $F_Q(Z)$ axially for three reasons. The K(Z) specified for the lowest six (6) feet of the core is based on large break LOCA analyses. Above this region the K(Z) value is based on DNBR requirements since the minimum DNBR would be expected in this region of the core, based on power, pressure, and temperature. The K(Z) value in the uppermost region of the core is based on the small break LOCA analyses. $F_Q(Z)$ in the uppermost region is limited to reduce the PCT expected during a small break LOCA since this region of the core is expected to uncover temporarily for some small break LOCA's.

The $BU(E_j)$ function shown in Figure TS.3.10-7 is a normalized function that limits $F_Q(Z)$ based on exposure dependent analyses for the ENC fuel. These analyses consider pin internal pressure uncertainties, fuel swelling, rupture pressures, and flow blockage.

F_Q^N is the measured Nuclear Hot Channel Factor, defined as the maximum local heat flux in the core divided by the average heat flux in the core. Heat fluxes are derived from measured neutron fluxes.

V(Z) is an axially dependent function applied to the equilibrium measured F_Q^N to bound F_Q^N's that could be measured at non-equilibrium conditions. This function is based on power distribution control analyses that evaluated the effect of burnable poisons, rod position, axial effects, and xenon worth.

F_Q^E, Engineering Heat Flux Hot Channel Factor, is defined as the allowance on heat flux required for manufacturing tolerances. The engineering factor allows for local variations in enrichment, pellet density and diameter, surface area of the fuel rod and eccentricity of the gap between pellet and clad. Combined statistically the net effect is a factor of 1.03 to be applied to fuel rod surface heat flux.

inches from the bank demand position. An accidental misalignment limit of 13 steps precludes a rod misalignment greater than 15 inches with consideration of maximum instrumentation error.

2. Control rod banks are sequenced with overlapping banks as described in Technical Specification 3.10.

3. The control bank insertion limits are not violated.

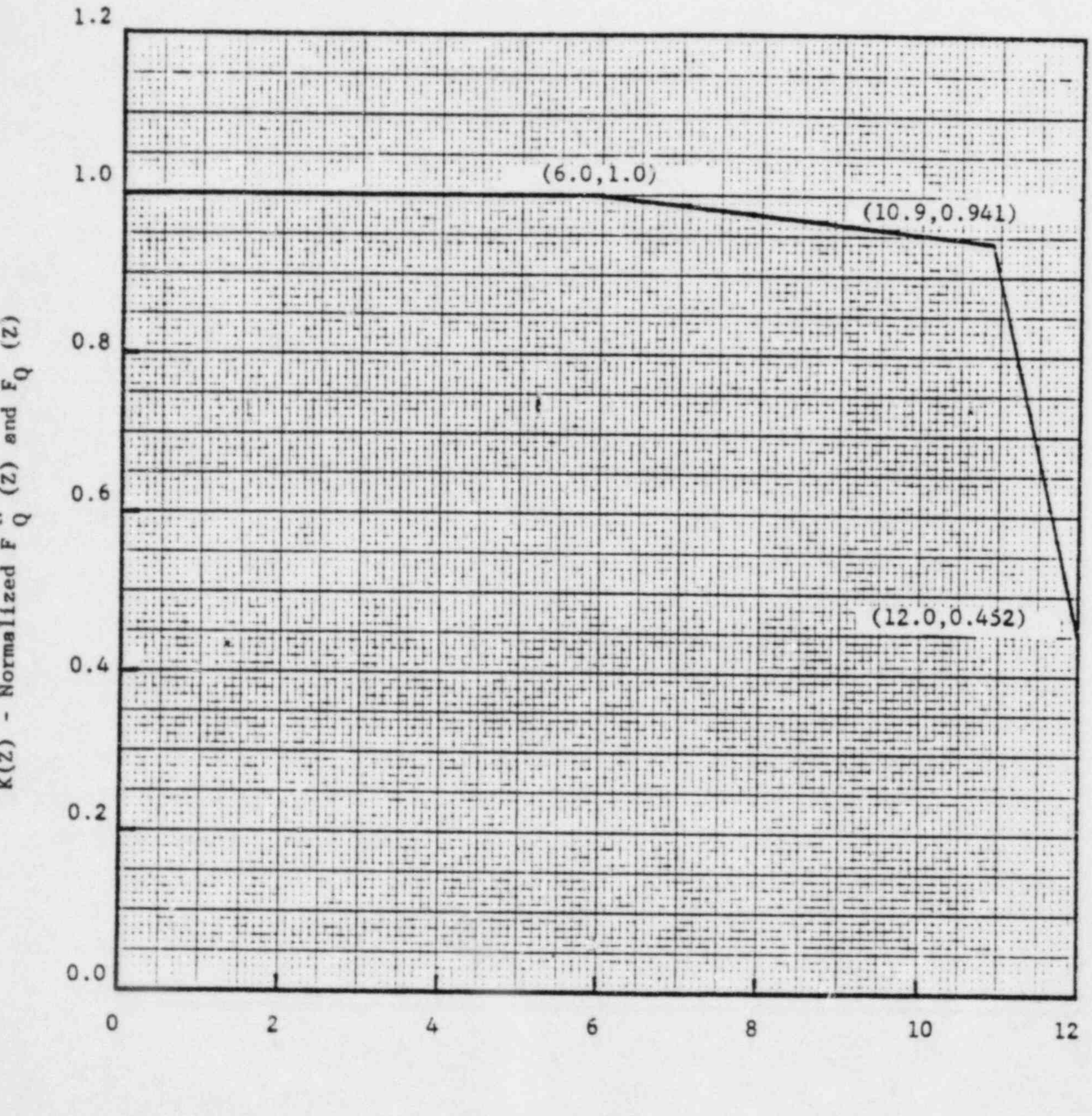
4. Axial power distribution control procedures, which are given in terms of flux difference control and control bank insertion limits are observed. Flux difference refers to the difference in signals between the top and bottom halves of two-section excore neutron detectors. The flux difference is a measure of the axial offset which is defined as the difference in normalized power between the top and bottom halves of the core.

The permitted relaxation in $F^N_{\Delta H}$ and F^N_Q allows for radial power shape changes with rod insertion to the insertion limits. It has been determined that provided the above conditions 1 through 4 are observed, these hot channel factor limits are met. In specification 3.10, F^N_Q is arbitrarily limited for $P \leq 0.5$ (except for low power physics tests).

The procedures for axial power distribution control referred to above are designed to minimize the effects of xenon redistribution on the axial power distribution during load-follow maneuvers. Basically control of flux difference is required to limit the difference between the current value of Flux Difference (ΔI) and a reference value which corresponds to the full power equilibrium value of Axial Offset (Axial Offset = ΔI/fractional power). The reference value of flux difference varies with power level and burnup but expressed as axial offset it varies only with burnup.

The technical specifications on power distribution control assure that the $F_Q(Z)$ upper bound envelope of 2.32 /P times Figures TS.3.10-5 and TS.3.10-7 is not exceeded and xenon distributions are not developed which at a later time, would cause greater local power peaking even though the flux difference is then within the limits specified by the procedure.

The target (or reference) value of flux difference is determined as follows: At any time that equilibrium xenon conditions have been established, the indicated flux difference is noted with the full length rod control rod bank more than 190 steps withdrawn (i.e., normal full power operating position appropriate for the time in life, usually withdrawn farther as burnup proceeds). This value, divided by the fraction of full power at which the core was operating is the full power value of the target flux difference. Values for all other core power levels are obtained by multiplying the full power value by the fractional power. Since the indicated equilibrium was noted, no allowances for excore detector error are necessary and indicated deviation of $\pm$5 percent ΔI are permitted from the indicated reference value. Figure TS.3.10-6 shows the allowed deviation from the target flux difference as the function of thermal power.



HOT CHANNEL FACTOR NORMALIZED

OPERATING ENVELOPE

FIGURE TS.3.10-7
REV

Normalized Exposure Dependent

Function BU(E_j) for Exxon Nuclear Company Fuel

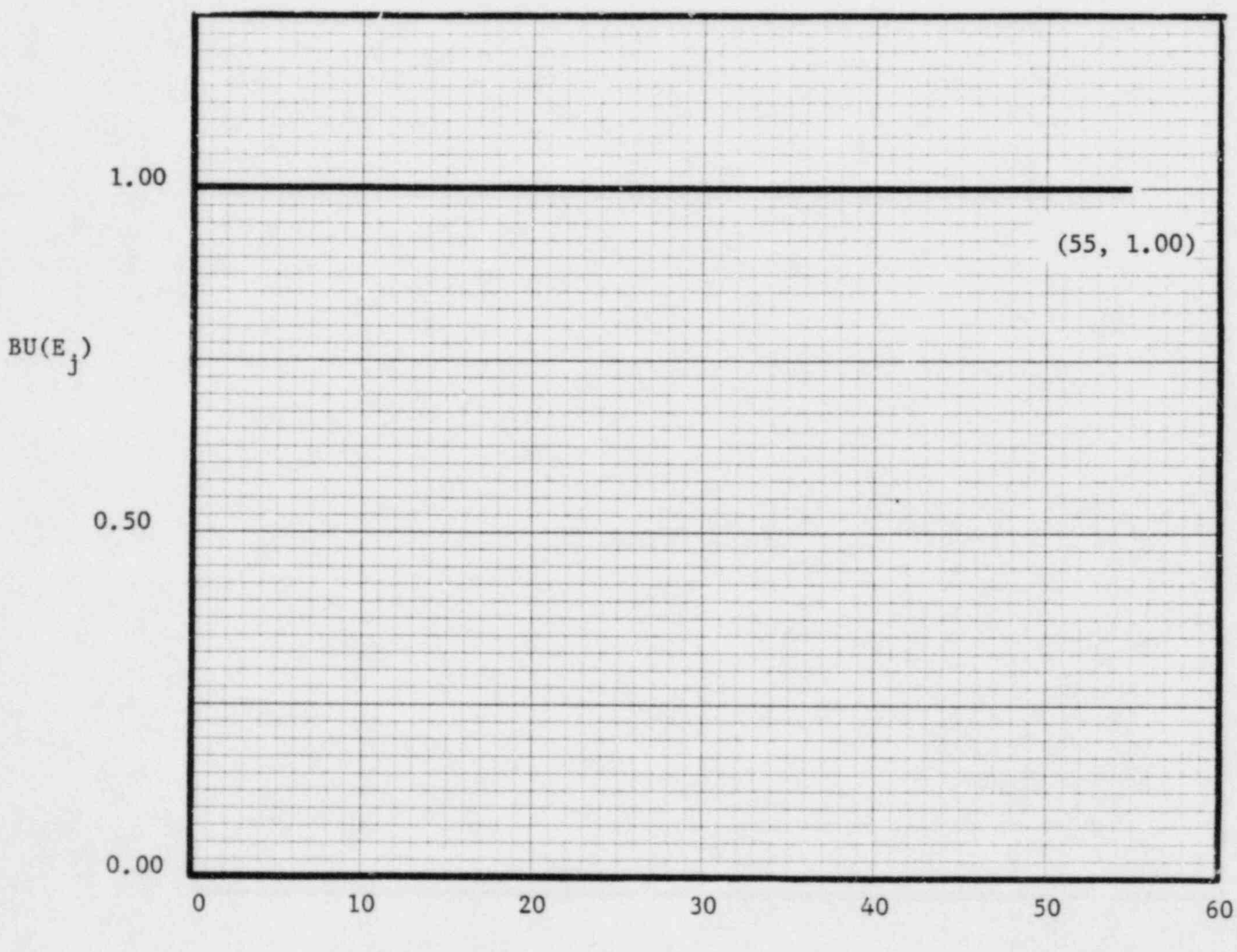


EXHIBIT C

PRAIRIE ISLAND NUCLEAR GENERATING PLANT

License Amendment Request - Dated June 24, 1983

XN-NF-83-38

Prairie Island Units 1 and 2

Limiting Break LOCA-ECCS Analysis

Using EXEM/PWR

XN-NF-83-38

PRAIRIE ISLAND UNITS 1 AND 2 LIMITING BREAK LOCA-ECCS ANALYSIS USING EXEM/PWR

MAY 1983

RICHLAND, WA 99352

EXXON NUCLEAR COMPANY, Inc.